

CLAIMS

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1 In a Wye-connected electrical system for supplying power from an AC
2 source to at least one nonlinear load connected to a phase line therein, a device for
3 substantially eliminating currents in the neutral wire generated by the nonlinear
4 load, said device comprising:

5 an electrical circuit comprising

6 a first passive electrical component connected in series
7 between the AC source and the nonlinear load,

8 a second passive electrical component connected in parallel to
9 said first passive electrical component,

10 a third passive electrical component connected in parallel to
11 said first and said second passive electrical components; and

12 wherein said first, said second, and said third passive electrical components
13 of said circuit are tuned to a harmonic frequency of a fundamental frequency of the
14 AC source so as to substantially eliminate a harmonic current drawn by the
15 nonlinear load.

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1 A device as recited in claim 1, wherein:

2 said first, said second, and said third passive electrical components are tuned
3 to a third harmonic frequency of the AC source.

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1 A device as recited in claim 1, wherein:

2 said first passive electrical component comprises a capacitor;

3 said second passive electrical component comprises a reactor; and

4 said third passive electrical component comprises a resistor.

1 A device as recited in claim 2, wherein:
 2 said first passive electrical component comprises a capacitor;
 3 said second passive electrical component comprises a reactor; and
 4 said third passive electrical component comprises a resistor.

1 A harmonic current eliminating device as recited in claim 1, wherein:
 2 each phase line in the electrical system ^{supply power} is connected to at least one nonlinear
 3 load;
 4 said device comprises a plurality of said electrical circuits, each of said
 5 electrical circuits being connected along a separate phase line therein and in series
 6 with at least one nonlinear load ^{whose power is supplied to said electrical circuit} so as to substantially eliminate a harmonic current
 7 drawn thereby; and ^{by the @ least one load}
 8 wherein each of said electrical circuits is tuned to an identical harmonic
 9 frequency of the AC source.

1 A harmonic current eliminating device as recited in claim 2, wherein:
 2 each phase line in the electrical system is connected to at least one nonlinear
 3 load;
 4 said device comprises a plurality of said electrical circuits, each of said
 5 electrical circuits being connected along a separate phase line therein and in series
 6 with at least one nonlinear load so as to substantially eliminate a harmonic current
 7 drawn thereby; and
 8 wherein each of said electrical circuits is tuned to a third harmonic of the AC
 9 source.

1 A device for substantially eliminating a harmonic current generated by a
2 nonlinear load in an electrical distribution system, the distribution system
3 distributing power from an AC source, said device consisting of:

4 a first passive electrical component connected in series with the nonlinear
5 load;

6 a second passive electrical component connected in parallel to said first
7 passive electrical component;

8 a third passive electrical component connected in parallel to said first and
9 said second passive electrical components; and

10 wherein said first, said second, and said third passive electrical components
11 are tuned to a harmonic frequency of the AC source so as to change the current
12 drawn by the nonlinear load.

1 A device as recited in claim 7, wherein:

2 said device is tuned to a third harmonic frequency of the AC source.

1 A device as recited in claim 7, wherein:

2 said first passive electrical component is a resistor;

3 said second passive electrical component is a reactor; and

4 said third passive electrical component is a capacitor.

1 A device as recited in claim 8, wherein:

2 said first passive electrical component is a resistor;

3 said second passive electrical component is a reactor; and

4 said third passive electrical component is a capacitor.

1 A device for substantially eliminating harmonic currents in an electrical
2 system having a nonlinear load and an AC source, and increasing the operational
3 range of the nonlinear load, comprising:

4 a first passive electrical component connected in series with the nonlinear
5 load;

6 a second passive electrical component connected in parallel to said first
7 passive electrical component;

8 a third passive electrical component connected in parallel to said first and
9 said second passive electrical component;

10 wherein said first, said second, and said third passive electrical components
11 are tuned to a third harmonic frequency of the AC source so as to substantially
12 alter current drawn by the nonlinear load.

1 A device as recited in claim 11, including:

2 a housing for said first, said second, and said third passive electrical
3 components; [and]

4 an equipment rack panel member connected to said housing so as to mount
5 said housing in an equipment rack^{for} storing the nonlinear load; and

6 wherein said equipment rack panel member is substantially perforated so as
7 to allow airflow to pass therethrough.

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1 A device as recited in claim 11, including:

2 an electrical housing member;

3 at least one electrical socket for connecting to the nonlinear load, said socket
4 being disposed along a first surface of said housing member; and

5 at least one bracket member for mounting said device along a substantially
6 planar surface so that said socket and said first surface of said housing member are
7 substantially aligned with said planar surface, said device substantially replacing a
8 conventional wall outlet.

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1 A device as recited in claim 11, wherein:

2 the nonlinear load comprises a computer having a monitor connected
3 thereto; and

4 said device further includes at least one monitor saver board, said monitor
5 saver board deactivates said monitor during periods of nonuse, and a housing
6 member having electrical connectors for connection to said monitor and to said
7 computer.

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1 A device as recited in claim 11, further including:

2 an isolation transformer;

3 a housing member having electrical connectors extending therefrom for
4 providing connection to the nonlinear load; and

5 at least one bracket member for attaching said housing member to a utility
6 cart.

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1 A device as recited in claim 15, wherein:
2 said isolation transformer is a hospital grade isolation transformer; and
3 the nonlinear load comprises electronic hospital equipment and said bracket
4 member attaches said housing member to a hospital utility cart, said cart holding
5 said electronic hospital equipment.

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1 A device as recited in claim 11, including:
2 means, connected in series with said parallel combination of said first, said
3 second, and said third passive electrical components, for clamping current levels
4 drawn by the nonlinear load, comprising a current clamping circuit, a sensor for
5 detecting a rapid rise in current drawn by the nonlinear load and means for
6 automatically deactivating said clamping circuit based upon signal levels detected
7 by said sensor.

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1 A device as recited in claim 17, wherein:
2 said first, said second, and said third device are tuned to a third harmonic
3 frequency of the AC source.

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1 A device as recited in claim 18, wherein:
2 said current level clamping circuit maintains a maximum current level drawn
3 by the nonlinear load to between approximately 6 and 8 amps; and
4 the nonlinear load includes a heating unit.